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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/635,431	08/10/2000	Takeshi Hoshida	1460.1007	6994

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EXAMINER
CUNNINGHAM, STEPHEN C

ART UNIT	PAPER NUMBER
3663	

DATE MAILED: 09/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/635,431	HOSHIDA ET AL.	
	Examiner	Art Unit	
	Stephen C. Cunningham	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 June 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1, 3, 5, 14, and 15 are rejected under 35 U.S.C. 103(a) as obvious over Ma et al. in view of Berger.

With respect to claim 1, Ma et al. teaches amplification in a parallel band amplifier comprising:

a plurality of optical adjusting means;

wavelength multiplexing means;

a pump source is inherent in each amplification section; and

a pump control based on the power taped from the amplification section output as in figure 3;

but fails to teach controlling so that an output of optical adjusting means for adjusting optical power of shorter-wavelength-band light becomes larger than an output of adjusting means for adjusting optical power of longer-wavelength-band light. Berger teaches controlling so that an output of optical adjusting means for adjusting optical power of shorter-wavelength-band light becomes larger than an output of adjusting means for adjusting optical power of longer-

wavelength-band light, see figure 3. It would have been obvious to modify Ma et al. in view of Berger et al. controlling each gain stage to output a desired power such that the short-wavelength channels have a greater power than the long-wavelength channels to compensate for the effects of Raman scattering and wavelength dependent loss in the transmission line.

With respect to claim 3, Berger teaches controlling means for controlling the outputs of said respective optical adjusting means so that optical powers of the respective wavelength bands at a predetermined point will become approximately identical when output light of the wavelength-multiplexing means travels to the predetermined point.

2. Claim 2, 6, 7, 37, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. in view of Berger et al.

Ma et al. fails to teach to teach controlling means. Berger teaches controlling means that determine a difference between the outputs of optical adjusting means for adjusting the optical power of shorter-wavelength-band light becomes larger than an output of adjusting means for adjusting optical power of longer-wavelength-band light.

3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berger in view of Ishikawa, or in the alternative Ma et al. in view of Berger and further in view of Ishikawa.

Berger fails to teach eliminating noise powers. Ishikawa teaches eliminating noise powers. It would have been obvious to modify Berger's device to eliminate noise powers and to calibrate the control means to account for the eliminated noise powers.

Ma et al. in view of Berger fails to teach eliminating noise powers. Ishikawa teaches eliminating noise powers. It would have been obvious to modify the device, Ma et al. in view of Berger, to eliminate noise powers and to calibrate the control means to account for the eliminated noise powers in order to maintain nearly equivalent channel powers.

With respect to claims 37 and 38, this is the inherent method by which amplification is performed.

4. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. in view of Berger, as applied to claim 1 above, and further in view of Toyohara.

Ma et al. in view of Berger fails to teach an increase or decrease in the number of channels in a WDM signal. Toyohara teaches a device where the number of channels in a WDM signal are increased or decreased. It would have been obvious to modify Berger's device to account for an increase of a decrease in the number of channels in a WDM signal in order to maintain gain flatness in communications system.

Ma et al. in view of Berger fails to teach an increase or decrease in the number of channels in a WDM signal. Toyohara teaches a device where the

number of channels in a WDM signal is increased or decreased. It would have been obvious to modify the device to account for an increase of a decrease in the number of channels in a WDM

5. Claim 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berger in view of Itou, or in the alternative Ma et al. in view of Berger and further in view of Itou.

With respect to claim 10, detecting means at a predetermined point where powers of the respective wavelength bands become approximately identical has not been taught. Itou teaches detecting means at a point where the respective wavelength channel powers become approximately identical. Channels are a species that anticipates the bands genus. It would have been obvious to modify Berger to include detecting means at said predetermined point in order to adjust the power adjusting means to flatten the power levels across the bands at said predetermined point.

With respect to claim 12, Itou teaches detecting means that detect the optical power of the WDM optical signals that include a shortest-wavelength channel.

6. Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berger in view of Ishikawa as applied to claim 4 above, and further in view of Itou, or in the alternative Ma et al. in view of Berger in further in view of Ishikawa, as applied to claim 4 above, and further in view of Itou.

With respect to claim 11, detecting means at a predetermined point where powers of the respective wavelength bands become approximately identical has not been taught. Itou teaches detecting means at a predetermined point where the respective wavelength channels become approximately identical. Channels are a species that anticipates the bands genus. It would have been obvious to modify Ma et al. in view of Berger further in view of Ishikawa to include detecting means at said predetermined point in order to adjust the power adjusting means to flatten the power levels across the bands at said predetermined point.

With respect to claim 13, Itou teaches detecting means that detect the optical power of the WDM optical signals that include a shortest-wavelength channel.

7. Claims 16, 17, 26, 27, 28, 29, 30, 32, 35, 36, 39, 41 are rejected under 35 U.S.C. 103(a) as being anticipated by Iwata et al. in view of Berger et al.

With respect to claim 16, Iwata teaches an optical sending apparatus comprising:

a plurality of optical sending means provided for generating WDM optical signals;

a plurality of optical adjusting means connected to said respective optical sending means, for adjusting optical powers of light beams;

wavelength-multiplexing means for wavelength-multiplexing outputs of said respective optical adjusting means; and

control means for performing control so that an output of optical adjusting means for adjusting optical power is pre-emphasized so the output of optical adjusting means compensates for adjustments due to propagation through the optical fiber, see column 14, lines 26-34, column 14, lines 26-30.

Iwata et al. fails to explicitly teach controlling so that the short-wavelength-signals are output at greater power than the long-wavelength signals. Berger et al. teach pre-emphasis of signals to compensate for Raman shift by adjusting the powers so that the short-wavelength-signals are output with greater power than the long-wavelength signals. It would have been obvious to modify Iwata et al. by controlling the pre-emphasis, to compensate for Raman gain, to output short-wavelength-signals with greater power than the power of the output of the long-wavelength signals.

With respect to claims 17 and 30, Iwata teaches controlling means that controls the outputs of said respective optical adjusting means so that optical powers of the respective wavelength light at a predetermined point will become approximately identical when output light of said wavelength-multiplexing means travels to the predetermined point.

With respect to claim 26 and 33, Iwata teaches a plurality of optical sending means that generate a WDM signal by generating a plurality of optical signals and wavelength-multiplexing said plurality of signals.

With respect to claim 29, refer back to the rejection of claim 16, Iwata also teaches an optical transmission line and wavelength-demultiplexing means for demultiplexing the WDM signal.

With respect to claim 41, Iwata teaches Maki9ng optical power of a WDM optical signal in a shorter-wavelength band larger than optical power of a WDM optical signal in a longer-wavelength band among a plurality of WDM optical signals in respective wavelength bands; and

inputting said plurality of WDM optical signals in the respective wavelength bands to an optical transmission line.

8. Claims 18 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata in view of Ishikawa. Iwata fails to teach eliminating noise powers. Ishikawa teaches eliminating noise powers. It would have been obvious to modify Iwata in view of Ishikawa in order to improve the signal to noise ratio (SNR).
9. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata in view of Berger. Iwata fails to explicitly teach compensating for Raman scattering. Berger teaches pre-emphasis to compensate for Raman scattering. It would have been obvious to modify Iwata to compensate for Raman scattering to equalize the SNR for each signal.
10. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata in view of Toyohara.

Iwata fails to teach a system where the number of signals may be increased or decreased. Toyohara teaches a system where the number of

channels in a WDM signal may be increased or decreased. It would have been obvious to modify Iwata in view of Toyohara in order to vary the number of channels in the WDM signal.

11. Claims 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata in view of Taga. Iwata fails to teach detecting at a predetermined point where optical powers are approximately identical. Taga teaches feedback from a predetermined point. It would have been obvious to modify Iwata in view of Taga to use detecting means at the predetermined point and use control means based on said detecting means in order to have the control based on real data rather than predicted results.

12. Claims 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata in view of Ishikawa, as applied to claim 18 above, and further in view of Taga. Iwata in view of Ishikawa fails to teach detecting at a predetermined point where optical powers are approximately identical. Taga teaches feedback from a predetermined point. It would have been obvious to modify Iwata in view of Taga to use detecting means at the predetermined point and use control means based on said detecting means in order to have the control based on real data rather than predicted results.

13. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata.

Iwata fails to teach the use of a spectrum analyzer in receiving means. A spectrum analyzer is well known in the art as a device for processing signals received from a transmission system.

14. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata in view of Ma et al.

With respect to claim 39, Iwata fails to teach amplifying WDM bands separately. Ma et al. teaches amplifying WDM bands separately. It would have been obvious to modify Iwata's method in to amplify WDM bands separately for the purpose of gain flattening.

15. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata in view of Ma et al. as applied to claim 39 above, and further in view of Berger.

Determining a difference between outputs has not been taught. Berger teaches determining an output and adjusting the outputs based on a comparison of the said outputs.

Response to Arguments

I. Rejection of Claims 1, 3, 5, 14, and 15 under 35 U.S.C. § 103(a) as obvious over Ma et al in view of Berger et al.

The applicant asserts:

(1) Ma et al fail to tech or suggest the features as recited in claim 1 of the present invention because Ma et al do not teach a control scheme that controls the output power of the shorter wavelength channels is greater than the output power of the longer wavelength channels; and

(2) Berger et al do not teach optical adjusting means adjusting demultiplexed signal bands requiring each wavelength to be adjusted individually.

With respect to argument (1), Ma is not relied to teach that the output power of the shorter wavelength channels is greater than the output power of the longer wavelength channels. Berger et al teach that controlling the output power of the shorter wavelength channels to be greater than the output power of the longer wavelength channels compensates for Raman induced cross-talk. The resulting combination is a parallel band amplifier that controls the gain spectrum to output greater amplification in the short wavelengths than in the longer wavelengths as taught by Berger et al, in figure 3, compensating for Raman induced cross-talk.

With respect to argument (2), Berger in not relied on to teach that the signal bands are demultiplexed and individually adjusted. Ma et al are relied on to teach that parallel band amplification is desirable for broadband amplification. Ma et al and Berger et are obvious to combine and respectively teach the lacking limitations in the counterpart.

The arguments presented by the applicant fail persuasive that the combination results in other than the claimed invention.

Claims 3, 5, 14, and 15 stand or fall with claim 1 and therefore the rejections are maintained.

II. Rejection of Claims 16, 17, 26-30, 32, 35, 36, 39, and 41 under 35 U.S.C. § 103(a) as obvious over Iwata et al in view of Berger et al.

The applicant argues that the Iwata et al fail to disclose controlling the short wavelengths to have a greater power than the longer wavelengths. This has been

admitted by the examiner. However when combined with the broad teaching of Berger et al, that high power short-band wavelengths and lower power long-band wavelengths compensates for Raman induced cross-talk in the system the examiner judges that invention as claimed would indeed have been obvious.

Claims 17, 26-30, 32, 35, 36, 39, and 41 stand or fall with claim 16 and therefore the rejections are maintained.

Claim 29 stands or falls with claim 16 and therefore the rejection is maintained.

With respect to Claims 39 and 41, Berger et al teaches controlling power of the shorter wavelength band to be greater than the power of the longer wavelength band in order to compensate for Raman induced cross-talk between the signal channels. The rejections of claim 39 and 41 are maintained.

Claims 2, 4, 6-13, 18-25, 31, 33, 34, 38, and 40 stand or fall with claims 1, 16, 29, 37, 39, or 41 and therefore the rejections are maintained.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen C. Cunningham whose telephone number is 703-605-4275. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on 703-306-4171. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9326 for regular communications and 703-872-9327 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

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September 9, 2002

Thomas H. Tarcza

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